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मछली पालन के लिये ताजा पानी की गुणता छूटें

Indian Standard

QUALITY TOLERANCES FOR FRESH WATER FOR FISH CULTURE

UDC 628·1 : 639·31 : 543·3 : 620·16

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

January 1994 **Price Group 2**

Water Sectional Committee, CHD 013

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards after the draft finalized by the Water Sectional Committee had been approved by the Chemical Division Council.

Inland surface waters are rivers (including rivers liable to seasonal drying), estuaries, streams, lakes, impounded reservoirs, canals and man-made or natural drains leading to the above water bodies. These are generally used for fish culture. Certain compounds are toxic and it may have some adverse effects in fish culture. Proper quality of water, therefore, is necessary to provide protection and propagation to fish and other aquatic life.

The technical committee responsible for the formulation of this standard is working on the suitable limit together with method of test for faecal coliform to be specified in the standard.

The composition of the technical committee responsible for the formulation of this standard is given in Annex B.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

QUALITY TOLERANCES FOR FRESH WATER FOR FISH CULTURE

1 SCOPE

This standard prescribes the tolerance limits for fresh water for fish culture.

2 REFERENCES

The Indian Standards listed in Annex A are necessary adjuncts to this standard.

3 TOLERANCE LIMITS

Water used for fish culture shall comply with the tolerance limits prescribed in Table 1. Tests shall be carried out as prescribed in the relevant Indian Standard given in col 4 of Table 1.

NOTE — The water quality prescribed in Table 1 is not merely sub-lethal but also favourable for a mixed warm-water fish population and its food organism. It shall not, however, be assumed, that fish are not found or cannot survive in water with concentrations beyond these limits.

Table 1 Tolerance Limits for Fresh Water for Fish Culture

Sl No. (1)	Characteristic (2)	Tolerance Limit (3)	Method of Test, Cl Ref (4)
i)	*p*H value	6·5 to 8·5	IS 3025 (Part 11) : 1983
ii)	Dissolved oxygen, mg/l, *Min*	4 (*see* Note 1)	IS 3025 (Part 38) : 1989
iii)	Free ammonia (as N), mg/l, *Max*	1·5 (*see* Note 2)	IS 3025 (Part 34) : 1988
iv)	Specific conductivity at 25°C, μmhos, *Max*	$1\,500 \times 10^{-6}$	IS 3025 (Part 14) : 1984
v)	Free carbon dioxide (as CO_2), mg/l, *Max*	12 (at sunrise)	43 of IS 3025 : 1964
vi)	Oils and grease	No visible colour film on the surface and no oily odour	IS 3025 (Part 39) : 1989
vii)	Alpha emitters, μc/l, *Max*	10^{-9}	58 of IS 3025 : 1964
viii)	Beta emitters, μc/l,	10^{-8}	58 of IS 3025 : 1964
ix)	Turbidity, NTU, *Max*	10	IS 3025 (Part 10) : 1984
x)	Total iron (as Fe), mg/l, *Max*	2·0	32 of IS 3025 : 1964
xi)	Temperature, °C, range	2 to 35	IS 3025 (Part 9) : 1984
xii)	Salinity mg/l, *Max*	1 000	5 of IS 2488 (Part 3) : 1968
xiii)	Alkalinity (as $CaCO_3$), mg/l	100 to 300	IS 3025 (Part 23) : 1986
xiv)	Nitrate nitrogen (as N), mg/l, *Max*	2·0	IS 3025 (Part 34) : 1988
xv)	Residual free chlorine, mg/l, *Max*	0·02	IS 3025 (Part 26) : 1986
xvi)	Sulphurated hydrogen (as H_2S)	absent (*see* Note 3)	16 of IS 2488 (Part 1) : 1966
xvii)	Phenolic compounds (as C_6H_5OH), mg/l, *Max*	0·001	14 of IS 2488 (Part 1) : 1966
xviii)	Pesticides	absent (*see* Note 4)	8 of IS 2488 (Part 3) : 1968
xix)	Syndets (as ABS), mg/l, *Max*	0·5 (*see* Note 5)	Annex B of IS 4955 : 1993
xx)	Cyanide (as CN), mg/l, *Max*	0·025	IS 3025 (Part 27) : 1986
xxi)	Arsenic (as As), mg/l *Max*	0·05	IS 3025 (Part 37) : 1988
xxii)	Copper (as Cu), mg/l, *Max*	0·05	IS 3025 (Part 42) : 1992
xxiii)	Zinc (as Zn), mg/l, *Max*	0·5	39 of IS 3025 : 1964
xxiv)	Chromium, (as Cr^{+6}), mg/l, *Max*	0·05	17 of IS 2488 (Part 2) : 1968
xxv)	Lead (as Pb), mg/l, *Max*	0·05	37 of IS 3025 : 1964
xxvi)	Cadmium (as Cd), mg/l, *Max*	0·01	IS 3025 (Part 41) : 1992
xxvii)	Mercury (as Hg), mg/l, *Max*	0·001	IS 3025 (Part 48) : 1993

NOTES

1 It shall be borne in mind that coarse fish growth decreases when dissolved oxygen (DO) concentration drops below 25 percent of saturation level.

2 Growth retardation of some species of fish has been reported even at 0·5 mg/l level of ammonia.

3 Dissolved oxgyen and sulphurated hydrogen are incompatible.

4 The limits for individual pesticides for different species can, however, be determined by bio-assay techniques.

5 One milligram per litre can be tolerated infrequently for a period not exceeding 24 h. It shall be borne in mind that the ABS would increase toxicity of other materials.

6 Metals, namely, copper, chromium, lead and mercury shall not be more than the stipulated limits and if more than one metal is present, the total shall not exceed 0·5 mg/l.

ANNEX A

(*Clause* 2)

LIST OF REFERRED STANDARDS

IS No.	*Title*
2488 (Part 1) : 1966	Methods of sampling and test for industrial effluents, Part 1
2488 (Part 2) : 1968	Methods of sampling and test for industrial effluents, Part 2
2488 (Part 3) : 1968	Methods of sampling and test for industrial effluents, Part 3
3025 : 1964	Methods of sampling and test (physical and chemical) for water used in industry
3025 (Part 9) : 1984	Methods of sampling and test (physical and chemical) for water and wastewater : Part 9 Temperature (*first revision*)
3025 (Part 10) : 1984	Methods of sampling and test (physical and chemical) for water and wastewater : Part 10 Turbidity (*first revision*)
3025 (Part 11) : 1983	Methods of sampling and test (physical and chemical) for water and wastewater : Part 11 *p*H value (*first revision*)
3025 (Part 14) : 1984	Methods of sampling and test (physical and chemical) for water and wastewater : Part 14 specific conductance (wheatstone bridge, conductance cell) (*first revision*)
3025 (Part 23) : 1986	Methods of sampling and test (physical and chemical) for water and wastewater : Part 23 Alkalinity (*first revision*)
3025 (Part 26) : 1986	Methods of sampling and test (physical and chemical) for water and wastewater : Part 26 Chlorine, residual (*first revision*)
3025 (Part 27) : 1986	Methods of sampling and test (physical and chemical) for water and wastewater : Part 27 Cyanide (*first revision*)
3025 (Part 34) : 1988	Methods of sampling and test (physical and chemical) for water and wastewater : Part 34 Nitrogen (*first revision*)
3025 (Part 37) : 1988	Methods of sampling and test (physical and chemical) for water and wastewater : Part 37 Arsenic (*first revision*)
3025 (Part 38) : 1989	Methods of sampling and test (physical and chemical) for water and wastewater : Part 38 Dissolved oxygen (*first revision*)
3025 (Part 39) : 1989	Methods of sampling and test (physical and chemical) for water and wastewater : Part 39 Oil and grease (*first revision*)
3025 (Part 41) : 1992	Methods of sampling and test (physical and chemical) for water and wastewater : Part 41 Cadmium (*first revision*)
3025 (Part 42) : 1992	Methods of sampling and test (physical and chemical) for water and wastewater : Part 42 Copper (*first revision*)
3025 (Part 48) : 1993	Methods of sampling and test (physical and chemical) for water and wastewater : Part 48 Mercury (*first revision*)
4955 : 1993	Household laundry detergent powders (*third revision*)

ANNEX B

(*Foreword*)

COMMITTEE COMPOSITION

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Shri P. C. D. G. Samuel
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(*Continued on page* 4)

(Continued from page 3)

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BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones : 331 01 31, 331 13 75

Telegrams : Manaksanstha
(Common to all Offices)

Regional Offices :	Telephone
Central : Manak Bhavan, 9 Bahadur Shah Zafar Marg NEW DELHI 110002	331 01 31 331 13 75
Eastern : 1/14 C. I. T. Scheme VII M, V. I. P. Road, Maniktola CALCUTTA 700054	37 84 99, 37 85 61 37 86 26, 37 86 62
Northern : SCO 445-446, Sector 35-C, CHANDIGARH 160036	53 38 43, 53 16 40 53 23 84
Southern : C. I. T. Campus, IV Cross Road, MADRAS 600113	235 02 16, 235 04 42 235 15 19, 235 23 15
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